

Bidding for urban public transport: an econometric analysis of French competitive trends

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Disclaimer:

The authors advised Veolia Transport in its merger with Transdev

The views expressed are those of the speakers only

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Motivation

- Broad question: does the introduction of competition for market in public services actually yield competition, or does it merely create dominant actors?
- Past literature on urban public transport in France suggests the latter:
 - Amaral et al. (2009): the French market is characterized by few competitors and collusive behaviours
 - Yvrande-Billon (2009): large incumbency bias, with a significant advantage to largest firms; gains from tendering are far from being obvious

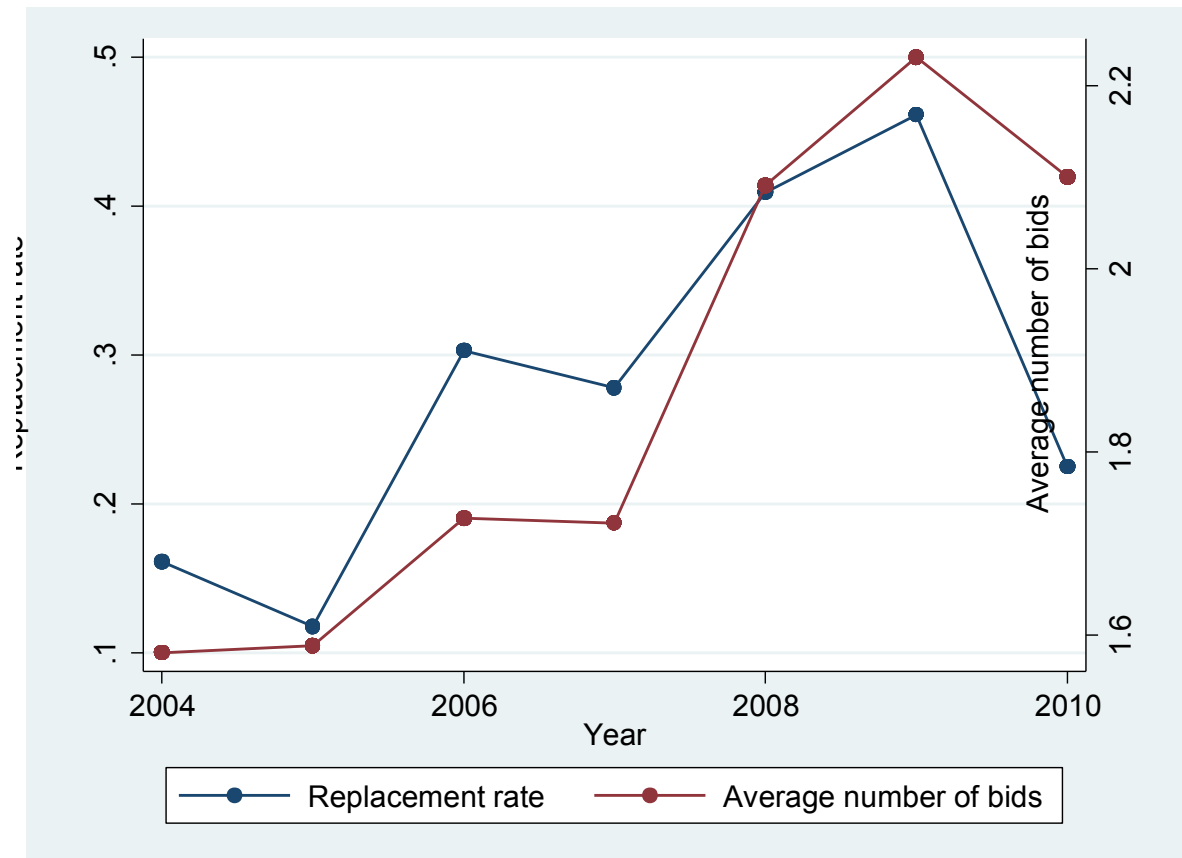
Motivation

- These articles are based on data earlier than 2006
 - Were the not-so-successful early years due to inertia in market opening or is the market still characterized by low competition levels?
 - This paper: data on 2004-2010
- These articles indirectly measured competition:
 - Data on the incumbent and the winner of the auction, but not on participation
 - Market shares in a bidding market say little about actual competition during auctions
 - This paper: collect data on participation by each firm

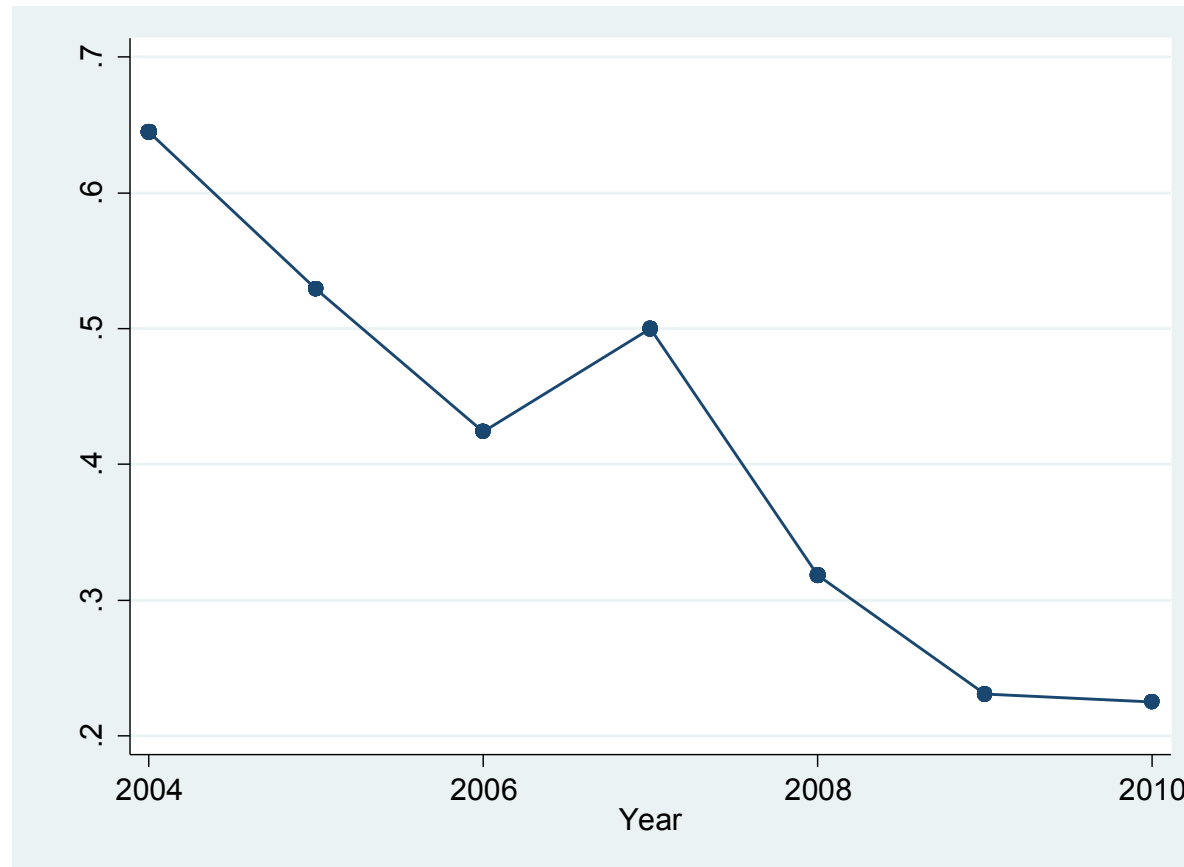
Data

- 204 auctions between 2004 and 2010
- For each, we know:
 - Identity of the incumbent
 - Identity of bidding firms and of the winning firm
 - Network and contract characteristics (population, size in km, duration, number of trips per inhabitant)
 - Ideology of the mayor (right or left wing)
- That allows us to empirically estimate the determinants of participation and success

Replacement rate & Average number of bids



Proportion of auctions with a single bid



2004-2010 trends

- Dramatic evolution in the past 6 years:
 - Lower incumbency bias
 - Higher participation due to:
 - Entry of new firms
 - More aggressive behaviour by existing firms
- Is this evolution robust to controlling for auctions' characteristics?
- Can we learn more about participation and success in auctions?

Econometric analysis

- Two relevant questions:
 - Determinants of participation
 - Determinants of success
- The second question depends on the first: we observe a firm's success only if it bid
- Econometric model with sample selection, estimated by maximum likelihood

Participation

- Probit with independent variables:
 - Duration of the contract
 - Log kilometers
 - Log population
 - Trips per inhabitant
 - Dummy for right-wing mayor
 - Number of networks operated by the firm the year before the auction
 - Dummies for Keolis, Transdev, or Veolia incumbents
 - Year fixed effects
- Also run a Poisson regression with the number of bids as the dependent variable

Table 2: Participation determinants

	(1)	(2)	(3)	(4)
	Probit	Probit	Probit	Poisson
Duration	0.021 (0.017)	0.023 (0.018)	0.024 (0.018)	0.016* (0.0084)
Log kilometers	0.25* (0.13)	0.23* (0.13)	0.18 (0.14)	0.095 (0.066)
Log population	-0.023 (0.16)	0.012 (0.17)	0.082 (0.17)	0.063 (0.090)
Trips per inhabitant	-5.65** (2.57)	-5.24* (2.71)	-4.88* (2.74)	-2.98** (1.49)
Right-wing mayor	0.29*** (0.11)	0.34*** (0.11)	0.36*** (0.12)	0.18** (0.070)
Number of networks, lagged		0.018*** (0.0019)	0.017*** (0.0019)	
Veolia incumbent			-0.43*** (0.16)	-0.36*** (0.096)
Transdev incumbent			-0.18 (0.20)	-0.096 (0.11)
Keolis incumbent			-0.16 (0.15)	-0.22** (0.10)
Constant	-3.05*** (0.40)	-3.65*** (0.44)	-3.33*** (0.46)	-0.40 (0.28)
Observations	907	907	907	165
Pseudo R^2	0.048	0.15	0.16	0.046

Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Participation determinants

- Interpretation of coefficients (using column 3):
 - The participation probability is 16.4 %
 - A right-wing mayor increases the probability of participation by 7.4 %
 - 10 more operated networks increase the probability of participation by 3.6 %
 - A one standard deviation in the number of trips per inhabitant decreases the probability of participation by 3.6 %
 - Year fixed effects: participation is not statistically lower in 2010 than in 2009

Success

- Estimation of the sample selection model requires some exclusion restriction:
 - Contract characteristics (size, duration, number of trips per inhabitant) influence participation but should have no effect on success
- Probit estimation for success with participation probit as a first stage

Success

Table 3: Success determinants

	(1) No sample selection	(2) Sample selection	(3) Sample selection
Incumbent	0.66*** (0.16)	-0.044 (0.32)	-0.097 (0.36)
Number of offers, inverse	3.15*** (0.37)	3.12*** (0.37)	3.13*** (0.40)
Number of networks, lagged	0.0024 (0.0032)	-0.0028 (0.0039)	-0.0036 (0.0046)
Veolia incumbent			0.035 (0.25)
Keolis incumbent			0.013 (0.22)
Transdev incumbent			-0.028 (0.28)
Constant	-1.80*** (0.32)	-0.69 (0.58)	-0.62 (0.63)
ρ		-0.58** (0.28)	-0.64* (0.34)
Observations	377	377	377
χ^2 , p -value	2.1e-27	3.2e-14	3.8e-13

Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Success determinants

- No incumbency bias once we take sample selection into account
- Incumbents win when participation is too low (could be because competitors know the incumbent does a good job, or that it is well-connected, etc.), but not because they are the incumbent
- The political dimension has yet to be taken into account

Success and ideology (not in the paper yet)

- Add to the regression an ideology dummy and interact it with the incumbency dummy
 - If the mayor is left-wing: being the incumbent increases the probability of winning by 42 %
 - If the mayor is right-wing: being the incumbent decreases the probability of winning by 35 %
- Very strong ideology effect, robust across specifications

Conclusions

- The urban public transport market in France has become more competitive since 2004
- Proper taking into account of sample selection shows no incumbency bias on average
- But bias when coupled with political affiliation